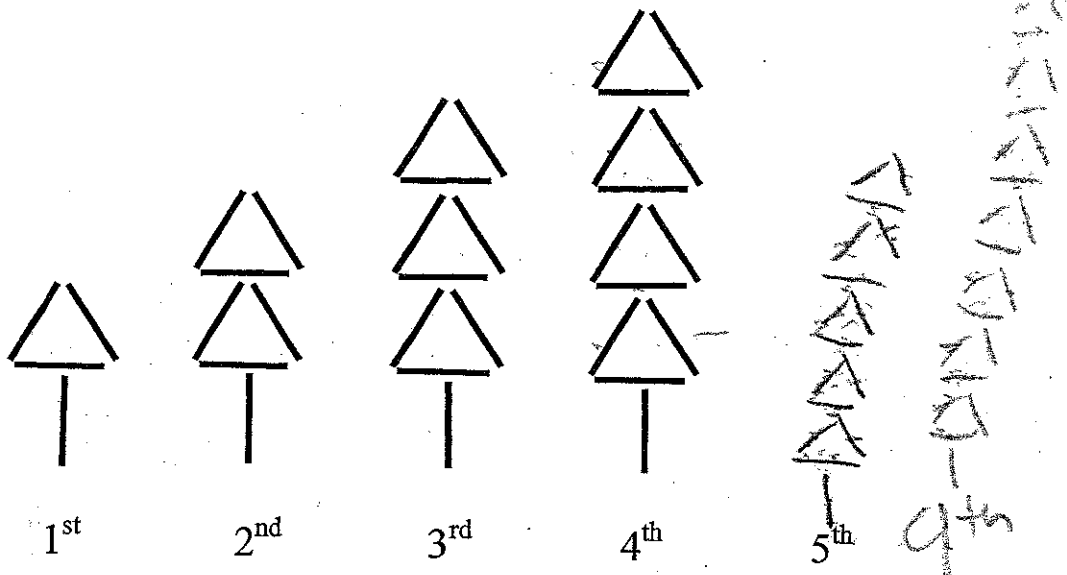


Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that?

You will need 16 toothpicks for figure 5 because the figure is how many triangles there will be.

How many toothpicks would you need to make the 9th tree?

How do you know that?

You will need 28 toothpicks because $9 \times 3 = 27 + 1 = 28$.

How many toothpicks would you need to make the 100th tree?

You will need 301.

How many toothpicks would you need to make the 43rd tree?

You will need 129.

What's the rule?

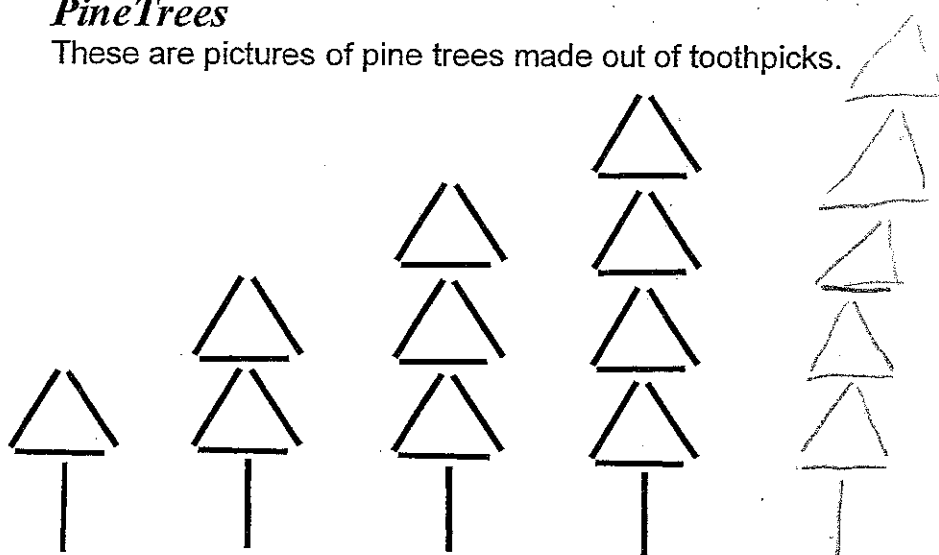
The rule is what ever the figure # is the number of triangles there is the you add 1 toothpick.

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

Pine Trees

These are pictures of pine trees made out of toothpicks.



1st

2nd

3rd

4th

5th

13

If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? you would need 16 because I know the 4th has 13 each \triangle has 3 so $13 + 3$

How many toothpicks would you need to make the 9th tree? = 18

How do you know that? I know the 4 has 13 $13 + 13 = 26 + 3 = 29$ so the ninth tree has 29 toothpicks

How many toothpicks would you need to make the 100th tree? = 300

How many toothpicks would you need to make the 43rd tree? = 129

What's the rule? add 3 each time

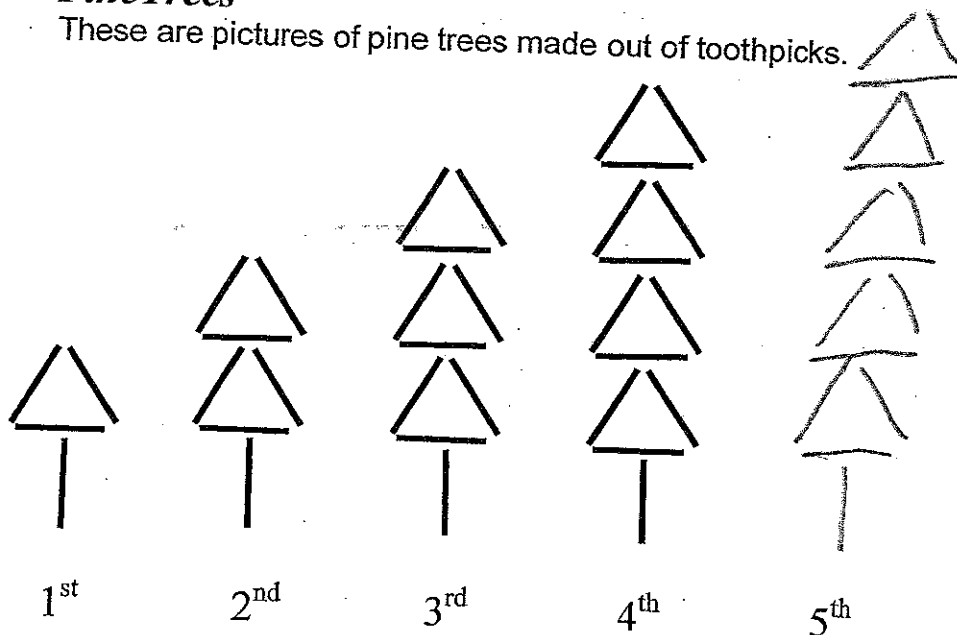
Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in? it would be in position 14

$$29 + 29 = 58 + 3 = 61$$

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? *You would need 16 picks*

How many toothpicks would you need to make the 9th tree?

How do you know that? *You would need 28 picks*

How many toothpicks would you need to make the 100th tree? *301 picks*

How many toothpicks would you need to make the 43rd tree? *130 picks*

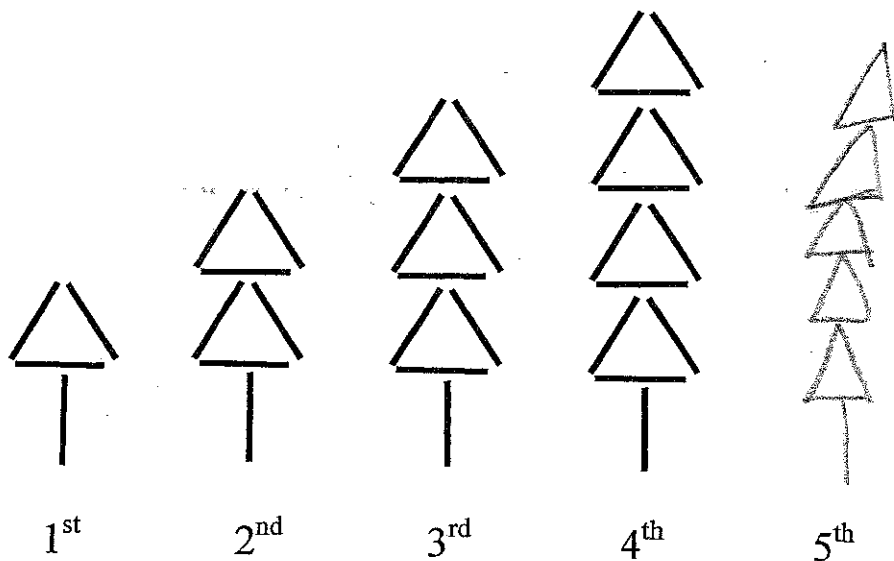
What's the rule? *# of picks = position # x 3 + 1*

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? *I think it would have 10 toothpicks because you add 3 more each time*

How many toothpicks would you need to make the 9th tree? *28*

How do you know that?

I know because I multiplied 9 by 3 and added 1

How many toothpicks would you need to make the 100th tree? *301*

How many toothpicks would you need to make the 43rd tree? *130*

What's the rule?

of toothpicks = Position number \times 3 + 1

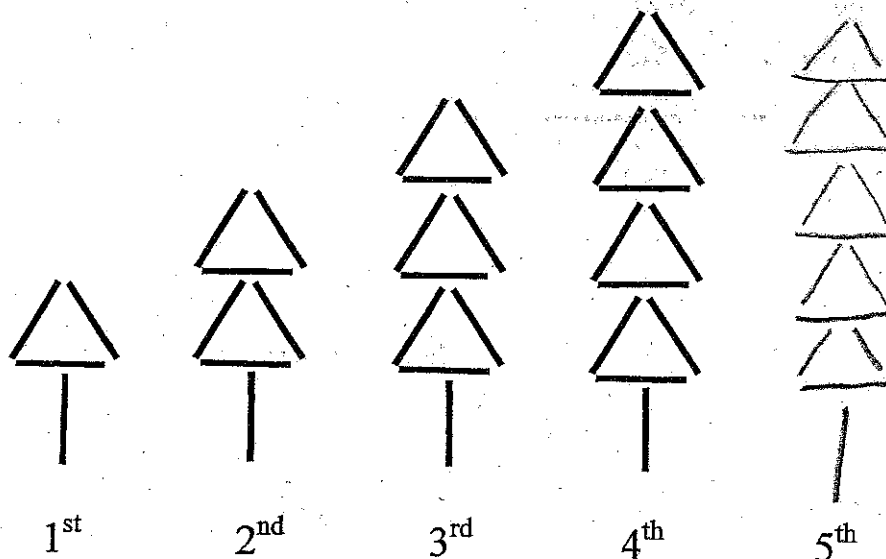
Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

Position 20

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that?

$5 \times 3 + 1 = 16$ You will need 16 toothpicks for the 5th tree. I know this because $5 \times 3 + 1 = 16$.

How many toothpicks would you need to make the 9th tree?

How do you know that?

$9 \times 3 + 1 = 28$ You will need 28 toothpicks for the 9th tree because I did $9 \times 3 + 1 = 28$.

How many toothpicks would you need to make the 100th tree? $100 \times 3 + 1 = 301$

How many toothpicks would you need to make the 43rd tree?

$43 \times 3 + 1 = 130$

What's the rule?

The rule is # of tree $\times 3 + 1$.

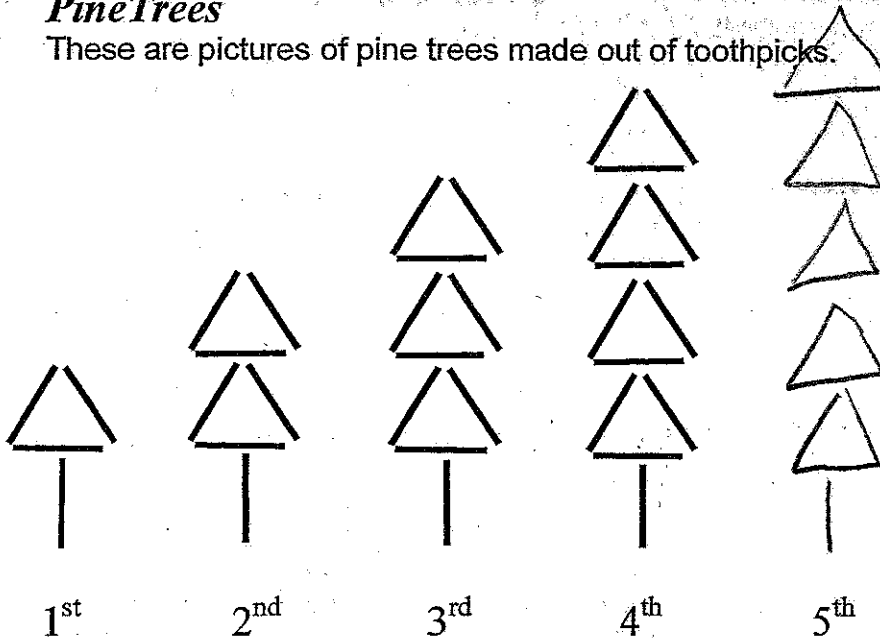
Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

43
43
43
29

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that?

You will need 16 toothpicks to make the next tree because each triangle has three toothpicks so $5 \times 3 = 15$ and you need to add one more because of the bottom!

How many toothpicks would you need to make the 9th tree?

You will need 28 toothpicks.

How do you know that?

I know that because $9 \times 3 = 27$ and if you add one more it will be 28 toothpicks.

How many toothpicks would you need to make the 100th tree?

You will need 306 toothpicks.

How many toothpicks would you need to make the 43rd tree?

You will need 129 toothpicks.

What's the rule?

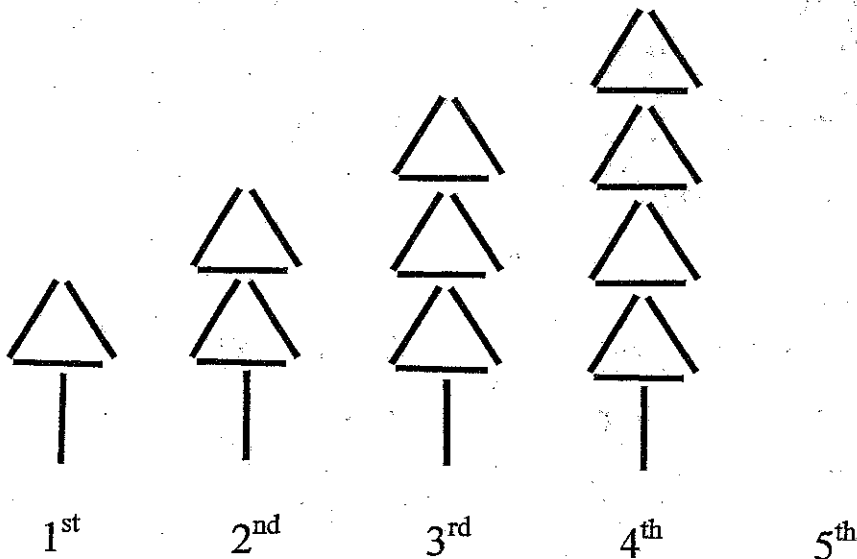
The rule is to add three.

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? *you would need 16 toothpicks because the rule is # of t = p# x 3 + 1.*

How many toothpicks would you need to make the 9th tree?

How do you know that? *you would need 28^{toothpicks} because the rule is # of t = p# x 3 + 1*

How many toothpicks would you need to make the 100th tree? *301*

How many toothpicks would you need to make the 43rd tree? *130*

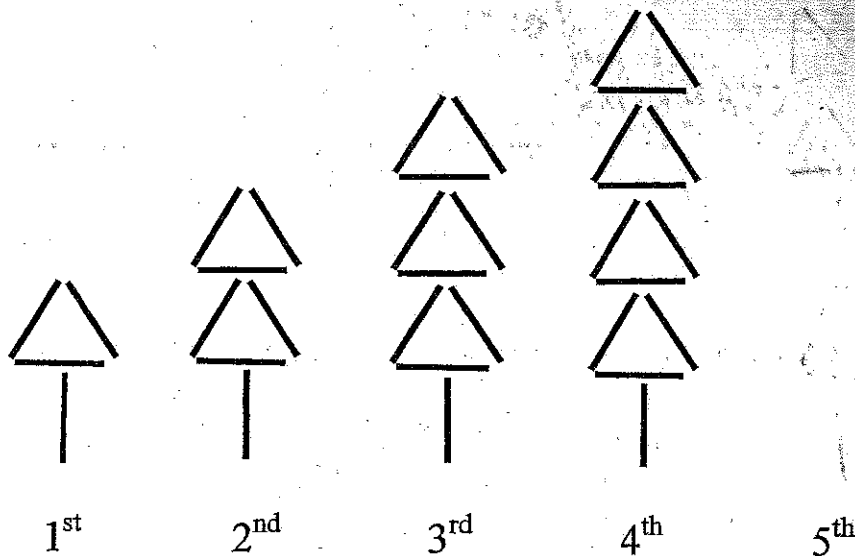
What's the rule? *# of t = p# x 3 + 1*

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in? *yes, it would be the 20th tree*

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? 16. Because if you look at number 1, 2, 3 and 4 there adding 3 more toothpicks for each one.

How many toothpicks would you need to make the 9th tree?

How do you know that? 28.

$$9 \times 3 = 28.$$

each number your adding 3.

How many toothpicks would you need to make the 100th tree?

$$100 \times 3 = 300.$$

How many toothpicks would you need to make the 43rd tree?

$$43 \times 3 = 29.$$

What's the rule? get the number times it by 3 the your done.

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

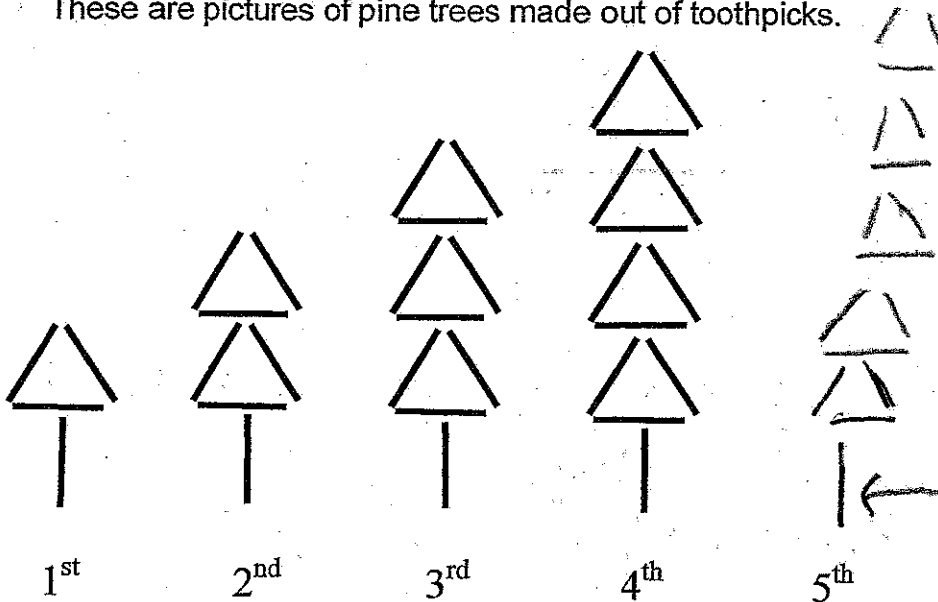
$$61 \times 3 = 183$$

In rows of 3.

20 up. with one sticking @ the top.

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that?

I know this because there are 3 toothpicks to make each triangle so you would multiply 3 by the figure. Then at the end you have to add 1 because there's the stick at the bottom.

How many toothpicks would you need to make the 9th tree?

How do you know that?

I know this because $3 \times 9 = 27 + 1 = 28$

How many toothpicks would you need to make the 100th tree?

How many toothpicks would you need to make the 43rd tree?

What's the rule?

The rule is $3 \times n + 1$

$$3 \times 43 = 129 + 1 = 130$$

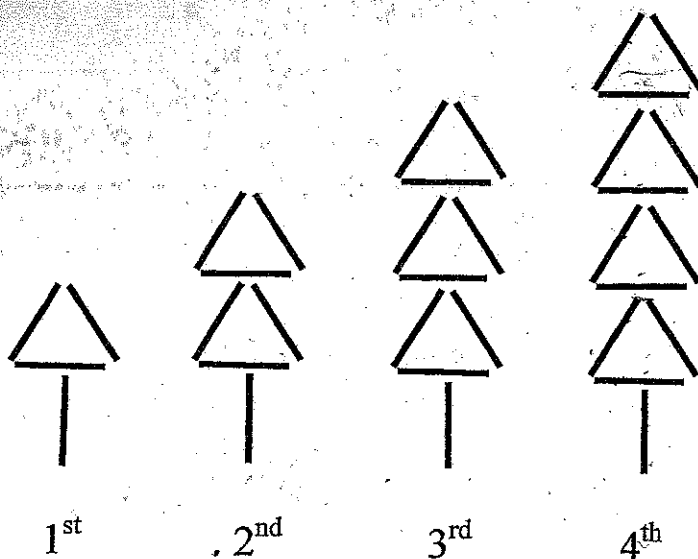
You would need 130 toothpicks.

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

Pine Trees

These are pictures of pine trees made out of toothpicks.



1st

2nd

3rd

4th

5th

6th

7th

8th

9th

If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? *It would take 16 toothpicks to make the 5th fig. because it's like $3n+1$ so each time it's a higher number you add 1 and times 3.*

How many toothpicks would you need to make the 9th tree?

How do you know that? *9th will have 29 toothpicks because*

How many toothpicks would you need to make the 100th tree?

How many toothpicks would you need to make the 43rd tree?

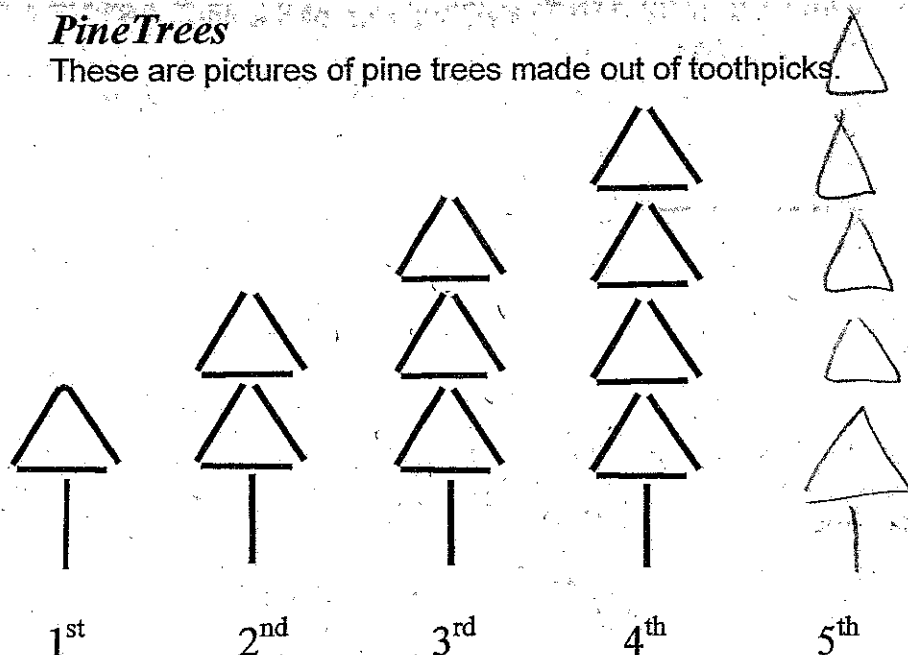
What's the rule?

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? 16. I know because every time you add one more level you add 3 more toothpicks so I counted the 4th one then added 3

How many toothpicks would you need to make the 9th tree?

How do you know that? 46. I figured $9 \times 3 + 1 = 46$.

How many toothpicks would you need to make the 100th tree? 301 toothpicks

How many toothpicks would you need to make the 43rd tree? 130

What's the rule? The tree number times 3 + 1.

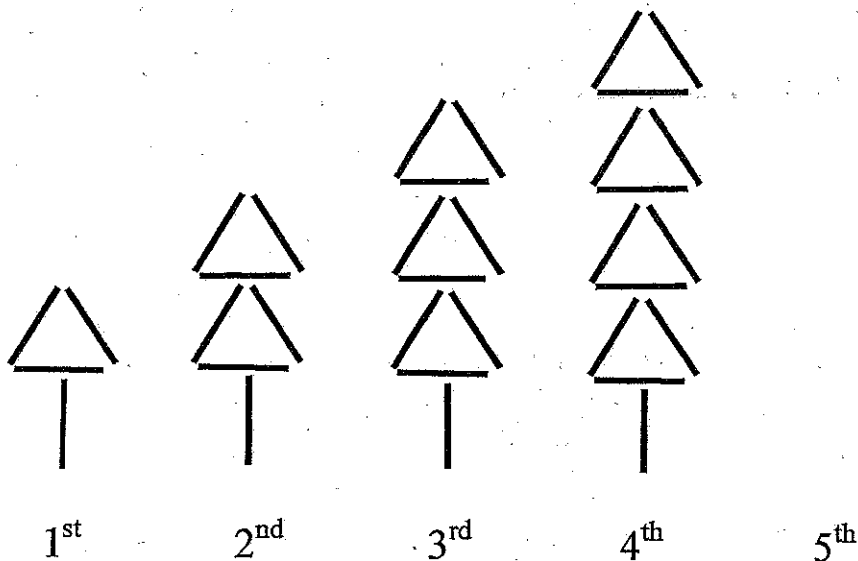
Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in? 20th

$$\begin{array}{r} 43 \\ 3 \\ \hline 129 \end{array}$$

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? 16 because it goes up by 3 each time

How many toothpicks would you need to make the 9th tree?

How do you know that? 31 because I added 3 repeatedly

How many toothpicks would you need to make the 100th tree? 400

How many toothpicks would you need to make the 43rd tree?

What's the rule? 172 tree number $\times 4$

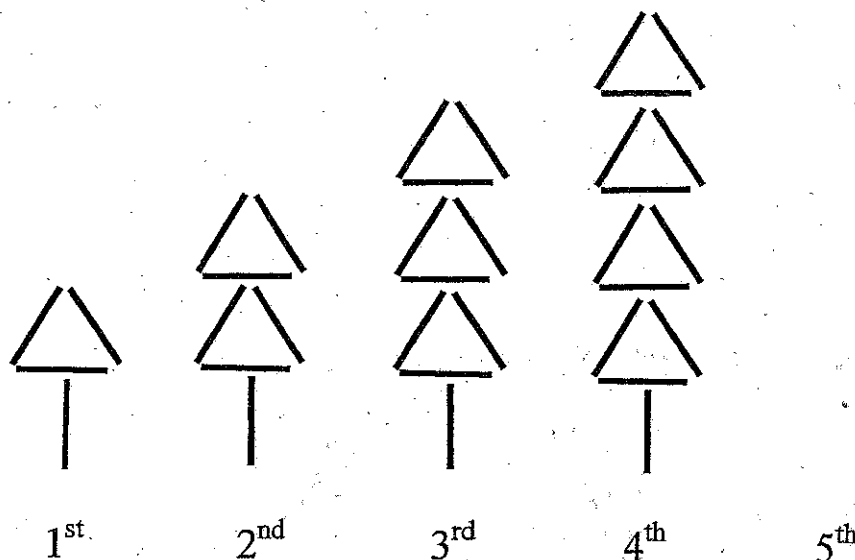
Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

yes and 18th tree

Pine Trees

These are pictures of pine trees made out of toothpicks.



a) If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

b) How do you know that? 16

b- if you add 3 more tooth picks to #4 you get 16

c) How many toothpicks would you need to make the 9th tree?

d) How do you know that? 28

d- 1 2 3 4 5 6 7 8 9
4 7 10 13 16 19 22 25 28

e) How many toothpicks would you need to make the 100th tree?

f) How many toothpicks would you need to make the 43rd tree?

g) What's the rule? $3n$

133

g- add 3 each time

Bonus Question

10	20	30	40	50	40	41
31	62	93	124	155	124	127
60	70	80	90	100	42	43
186	217	258	279	310	130	133

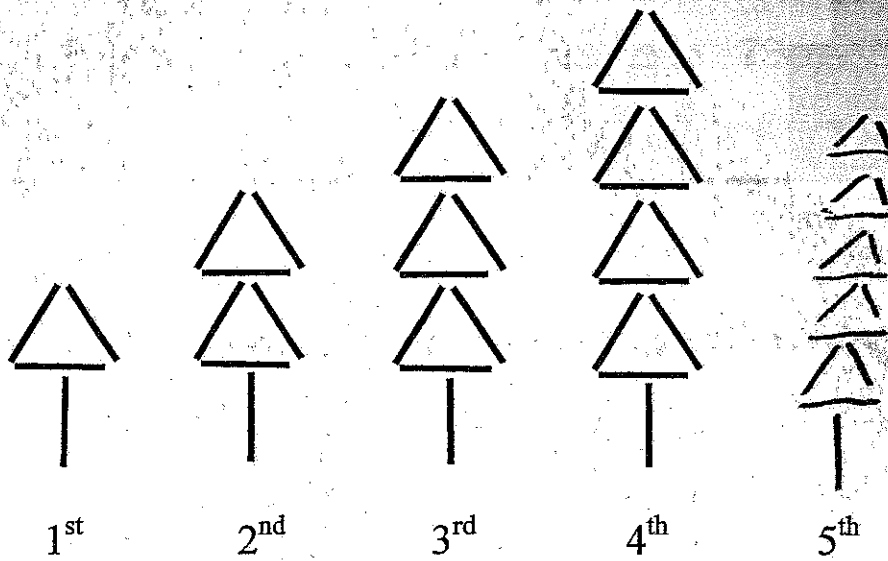
a) If you had 61 toothpicks could you make a tree that fits this pattern? b) What position would it be in?

a) no because pattern 20 is 62

b) none

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

16.

How do you know that?

Because p1 has 4, p2 has 7 and p3 has 10. It just keeps going up by 3 each time.

How many toothpicks would you need to make the 9th tree?

28

How do you know that?

Because 4 more times 3 on 16 is 28.

How many toothpicks would you need to make the 100th tree?

301

How many toothpicks would you need to make the 43rd tree?

What's the rule?

$\times 3$ each time + 1

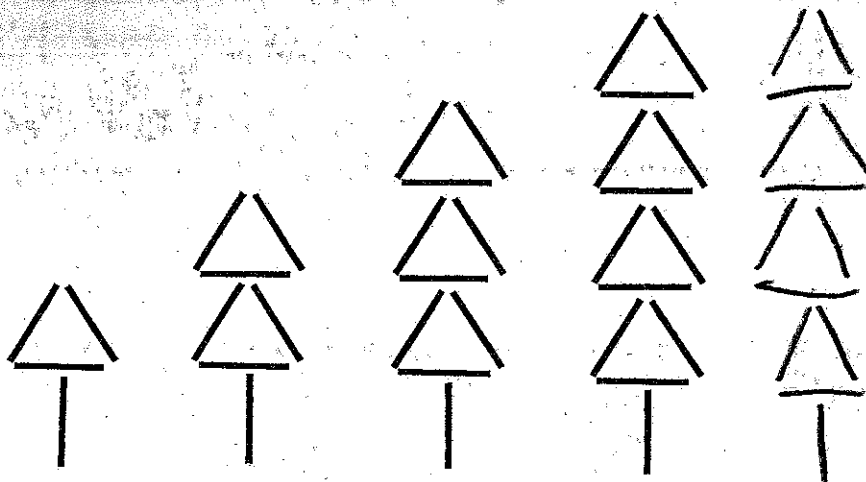
Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

p. 20.

Pine Trees

These are pictures of pine trees made out of toothpicks.



1st

2nd

3rd

4th

5th

6 19 7 22 8 25 9 28

If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that? You would need sixteen toothpicks to make the fifth tree.

How many toothpicks would you need to make the 9th tree?

How do you know that? You would need 28 toothpicks to make the 9th. I just added 3 toothpicks each time.

How many toothpicks would you need to make the 100th tree? 301

How many toothpicks would you need to make the 43rd tree? 115

What's the rule? $3n + 1$.

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

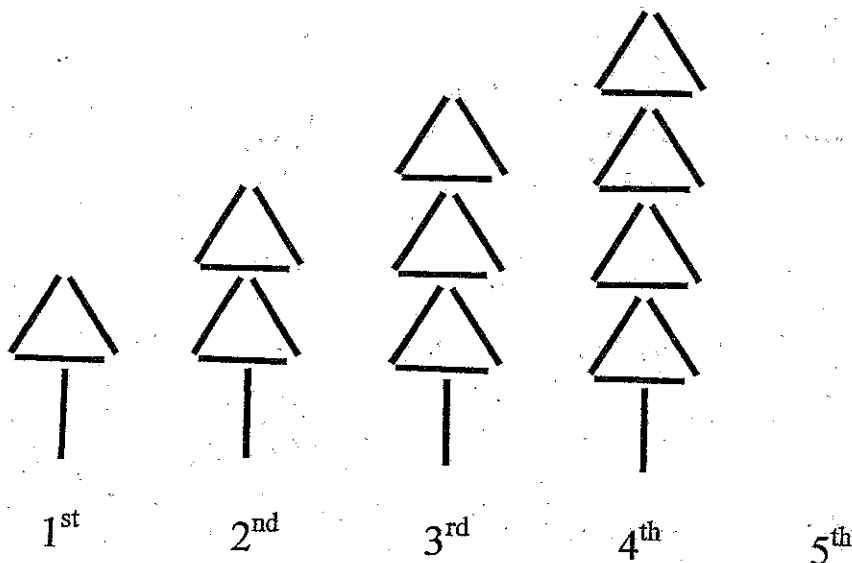
No because the last number is always 1, 2, 5, 8. No the closest you could get would be 60.

$$\begin{array}{r} 26 \\ \times 3 \\ \hline 78 \end{array} \quad \begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array} \quad \begin{array}{r} 20 \\ \times 3 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 13 \\ \times 3 \\ \hline 39 \end{array}$$

Pine Trees

These are pictures of pine trees made out of toothpicks.



If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that?

You need 16 toothpicks. Because each time you add 3 plus the 1.

How many toothpicks would you need to make the 9th tree?

How do you know that?

You need 28 toothpicks. Because each time you add 3 plus the 1.

How many toothpicks would you need to make the 100th tree?

How many toothpicks would you need to make the 43rd tree?

What's the rule?

301 toothpicks. 130 toothpicks. Start at 1 and add 3 toothpicks each turn.

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

You could make the 20th figure.

Pine Trees

These are pictures of pine trees made out of toothpicks.



1st



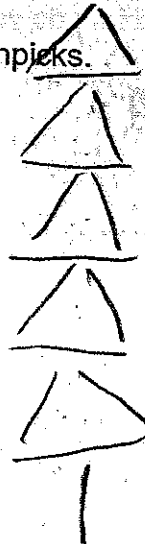
2nd



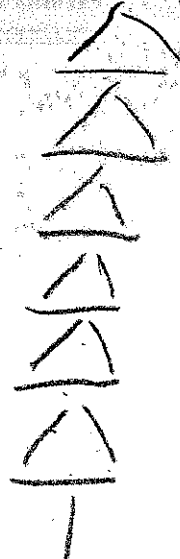
3rd



4th



5th



9th

If this pattern continues to increase with the addition of one more triangle each time, how many toothpicks would you need to make the next (5th) tree?

How do you know that?

$$5 \times 3 = 15 + 1 = 16$$

How many toothpicks would you need to make the 9th tree?

How do you know that?

$$9 \times 3 = 27 + 1 = 28$$

How many toothpicks would you need to make the 100th tree?

$$100 \times 3 = 300 + 1 = 301$$

How many toothpicks would you need to make the 43rd tree?

$$43 \times 3 = 129$$

What's the rule?

$\underline{\hspace{2cm}} \times 3 = \underline{\hspace{2cm}} + 1 = \underline{\hspace{2cm}}$
<p>figure # answer answer in total</p>

Bonus Question

If you had 61 toothpicks could you make a tree that fits this pattern? What position would it be in?

$$20 \times 3 = 60 + 1 = 61$$

$$60 \div 3 = 20$$

It could make figure #20